



# Sun N1 System Manager 1.3 Site Preparation Guide



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# Preface

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The *Sun N1 System Manager 1.3 Installation and Configuration Guide* describes the requirements, network and hardware connections and preparation processes, and the procedures for installing and configuring the base operating system and then the Sun N1™ System Manager system.

## Who Should Use This Book

This guide is intended for system administrators who are responsible for preparing the hardware and network for installation of the N1 System Manager software. The system administrators must have extensive knowledge and experience in the following areas:

- The Solaris™, Linux, and Windows operating systems, and the network administration tools provided by each operating system
- Network equipment and network devices from a variety of vendors such as Sun and Cisco
- DNS, DHCP, IP addressing, subnetworks, VLANs, SNMP, TFTP, NFS, and mail configuration
- Network device interconnections and cabling
- Linux Kickstart™ installation
- Solaris JumpStart™ installation
- Microsoft Remote Installation Services (RIS) server installation
- Suse AutoYaST installation

## How This Book Is Organized

- [Chapter 1](#) provides an overview of the N1 System Manager system preparation work flow.
- [Chapter 2](#) lists the hardware and software required for a successful installation of the N1 System Manager, and provides references and guidelines describing how to connect the N1 System Manager management server to servers that are to be managed and to external Ethernet switches.
- [Chapter 3](#) describes how to install and configure an OS on the N1 System Manager system.
- [Appendix A](#) provides an overview and reference configuration diagrams for an alternative method of connecting Sun Fire™ V20z and V40z manageable servers to the N1 System Manager networks.

## Related Documentation

This guide is part of a nine-volume implementation reference set. The set should be read in the following order:

- *Sun N1 System Manager 1.3 Release Notes*
- *Sun N1 System Manager 1.3 Introduction*
- *Sun N1 System Manager 1.3 Site Preparation Guide*
- *Sun N1 System Manager 1.3 Installation and Configuration Guide*
- *Sun N1 System Manager 1.3 Discovery and Administration Guide*
- *Sun N1 System Manager 1.3 Operating System Provisioning Guide*
- *Sun N1 System Manager 1.3 Command Line Reference Manual*
- *Sun N1 System Manager 1.3 Grid Engine Provisioning and Monitoring Guide*
- *Sun N1 System Manager 1.3 Troubleshooting Guide*

## Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- [Documentation](http://www.sun.com/documentation/) (<http://www.sun.com/documentation/>)
- [Support](http://www.sun.com/support/) (<http://www.sun.com/support/>)
- [Training](http://www.sun.com/training/) (<http://www.sun.com/training/>)

## Typographic Conventions

The following table describes the typographic conventions that are used in this book.

TABLE P-1 Typographic Conventions

Typeface	Meaning	Example
AaBbCc123	The names of commands, files, and directories, and onscreen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name% you have mail.</code>
<b>AaBbCc123</b>	What you type, contrasted with onscreen computer output	<code>machine_name% su</code> Password:
<i>aabbcc123</i>	Placeholder: replace with a real name or value	The command to remove a file is <code>rm filename.</code>

TABLE P-1 Typographic Conventions (Continued)

Typeface	Meaning	Example
<i>AaBbCc123</i>	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . A <i>cache</i> is a copy that is stored locally. Do <i>not</i> save the file. <b>Note:</b> Some emphasized items appear bold online.

## Shell Prompts in Command Examples

The following table shows the default UNIX® system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	machine_name%
C shell for superuser	machine_name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell for superuser	#



# Site Preparation Overview

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This chapter provides a summary of the steps required to prepare your site for installation and configuration of the Sun N1 System Manager 1.3 system, and security issues you need to consider when preparing your site for the first-time installation of the Sun N1 System Manager software.

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**Note** – If you are upgrading an existing installation of the N1 System Manager, site preparation is not needed. Upgrade the N1 System Manager as described in Chapter 3, “Upgrading the Sun N1 System Manager Software,” in *Sun N1 System Manager 1.3 Installation and Configuration Guide*.

---

This section discusses the following topics:

- “Summary of Major Tasks” on page 13
- “Security Considerations” on page 16

## Summary of Major Tasks

The following diagram provides a high-level overview of the tasks required to prepare a site for Sun N1 System Manager 1.3 installation.

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**Note** – The term *manageable server* is used in this manual for any server that has not been discovered by the N1 System Manager. The term *management server* refers to the server on which the N1 System Manager is installed. The term *managed server* is used for any server that has been discovered by the N1 System Manager and is subsequently monitored and managed by the N1 System Manager.

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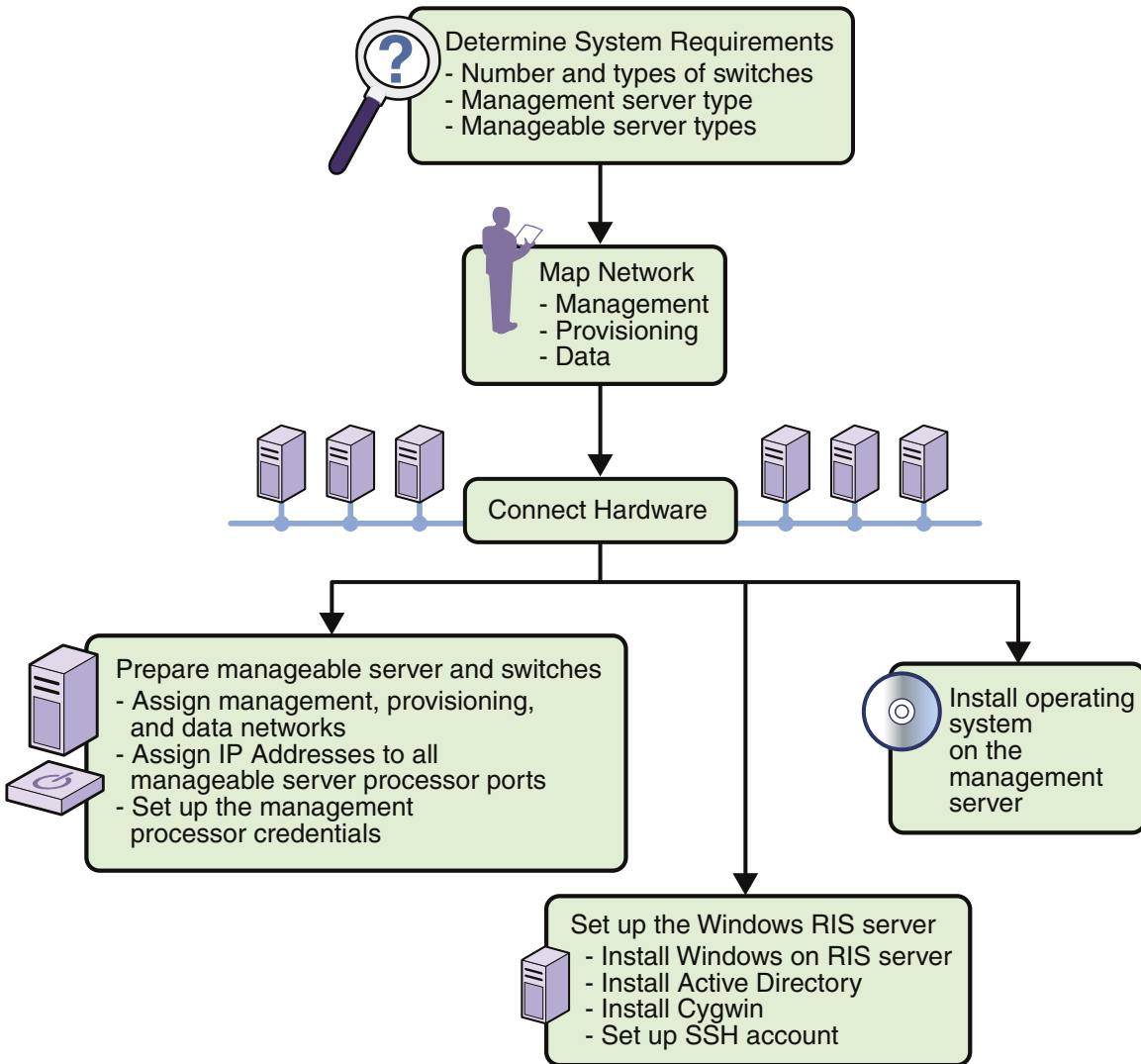


FIGURE 1-1 Site Preparation Task Flow

Summaries of each of the above tasks are provided in the following list.

- Determine system requirements
  - This task involves the following actions:
    - Inventory the equipment you want to use with the Sun N1 System Manager

- Compare the inventory to the system requirements, and if desired, purchase additional equipment
- Determine which server you will use as the management server and which operating system you will install on the management server
- Determine which servers you will monitor and manage using the N1 System Manager and, based on the total, determine your switch requirements

References:

- “Sun N1 System Manager Hardware and OS Requirements” on page 17
- “Sun N1 System Manager Connection Information” on page 25
- “Reference Configurations” on page 27
- “Management Server Considerations” on page 40
- “Switch Considerations” on page 42

■ Map network

This task involves the following actions:

- Determine the IP addressing scheme for the management, provisioning, and data networks.
- Determine whether you will use a single-switch configuration in which all connections are on a single switch, or a two-switch configuration, in which the management network is isolated on one switch and the data and provisioning networks are on the second switch.
- Determine the VLAN assignments.

References:

- “Reference Configurations” on page 27
- “Site Planning” on page 40

- Connect the hardware based on the information and decisions you have made in the preceding steps.
- Prepare the manageable servers

This task involves the following actions:

- Assign an IP address to the management port of each manageable server
- Set up the manageable server management processor account credentials where applicable

References:

- Server hardware documentation
- “Setting Up Manageable Servers” on page 44

- Install and configure an operating system on the management server.

This task can be performed at the same time as manageable server preparation and RIS server setup.

References:

- “Installing the Solaris OS on the Management Server” on page 53

- “Installing the RedHat Enterprise Linux OS on the Management Server” on page 55
- “Enabling FTP on the Management Server” on page 58
- “Updating the /etc/hosts File” on page 59
- “Setting Up a Windows Remote Installation Services Server” on page 49

## Security Considerations

The following list provides general security considerations that you should be aware of when you are using the N1 System Manager:

- The Java™ Web Console that is used to launch the N1 System Manager’s browser interface uses self-signed certificates. These certificates should be treated with the appropriate level of trust by clients and users.
- The terminal emulator applet that is used by the browser interface for the serial console feature does not provide a certificate-based authentication of the applet. The applet also requires that you enable SSHv1 for the management server. For certificate-based authentication or to avoid enabling SSHv1, use the serial console feature by running the `connect` command from the `n1sh` shell.
- SSH fingerprints that are used to connect from the management server to the provisioning network interfaces on the managed servers are automatically acknowledged by the N1 System Manager software by default, which might make managed servers vulnerable to “man-in-the-middle” attacks. You can configure how the N1 System Manager processes changed and unknown SSH keys by running the `n1smconfig` utility after the N1 System Manager has been installed or upgraded. See “Configuring SSH Unknown and Changed Host Key Policies” in *Sun N1 System Manager 1.3 Installation and Configuration Guide*.
- The Web Console (Sun ILOM Web GUI) autologin feature for Sun Fire X4100 and Sun Fire X4200 servers exposes the server’s management processor credentials to users who can view the web page source for the Login page. To avoid this security issue, disable the autologin feature by running the `n1smconfig` utility. See “Configuring the N1 System Manager” in *Sun N1 System Manager 1.3 Installation and Configuration Guide* for details.



# Sun N1 System Manager System and Network Preparation

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This chapter provides the Sun N1 System Manager hardware and software requirements, reference architectures, and procedures for preparing your N1 System Manager components.

The tasks provided in this chapter can be performed in parallel with the Microsoft Windows Remote Installation Services (RIS) server setup and with the management server preparation as described in the following sections:

- [“Setting Up a Windows Remote Installation Services Server” on page 49](#)
- [Chapter 3, Installing and Configuring an OS on the Management Server](#)

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**Note** – Do not run discovery or use the N1 System Manager system until all manageable servers have been configured as described in the following sections.

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This chapter discusses the following topics:

- [“Sun N1 System Manager Hardware and OS Requirements” on page 17](#)
- [“Sun N1 System Manager Connection Information” on page 25](#)
- [“Reference Configurations” on page 27](#)
- [“Site Planning” on page 40](#)
- [“Setting Up Manageable Servers” on page 44](#)
- [“Setting Up a Windows Remote Installation Services Server” on page 49](#)

## Sun N1 System Manager Hardware and OS Requirements

The information in this section will help you determine what operating system, hardware, and storage resources must be allocated or acquired to implement the N1 System Manager system.

This section discusses the following topics:

- [“Management Server Requirements” on page 18](#)
- [“Manageable Server Requirements” on page 20](#)

- “Manageable Server Firmware Requirements” on page 22
- “Microsoft Windows Image Server Requirements” on page 24
- “Recommended Switch Configuration” on page 25

## Management Server Requirements

N1 System Manager management server hardware and operating software minimum requirements are listed in the following table. See [Table 2–9](#) for specific management server sizing information based on the number of servers that are to be managed.



**Caution** – Dedicate the N1 System Manager management server only to the N1 System Manager software. Do not install other applications on the management server. The management server must not be managed by any system management software such as N1 System Manager, Sun Management Center, Sun Control Station, or any other management system.

**TABLE 2-1** Management Server Disk Space and RAM Requirements

Disk Space	RAM
72 Gbytes minimum for all management servers	4 Gbytes minimum for all management servers

**TABLE 2-2** SPARC-based Management Server Supported Hardware and Operating Systems

Type	Operating System
Netra™ 240, 440	Solaris Version 10, 64 bit
	Solaris Version 10 Update 1, 64 bit
Sun Fire™ T1000, T2000	Solaris Version 10 HW2, 64 bit
	Solaris Version 10 Update 1, 64 bit
Sun Fire V210, V240, V440	Solaris Version 10, 64 bit
	Solaris Version 10 Update 1, 64 bit
Sun Fire V490	Solaris Version 10, 64 bit
	Solaris Version 10 Update 1, 64 bit

TABLE 2-3 X86 and X64-based Management Server Supported Hardware and Operating Systems

Type	Operating System
Sun Fire X2100	Solaris x64 Version 10 HW1, 64 bit
	Solaris x64 Version 10 Update 1, 64 bit
	Red Hat Enterprise Linux 3.0 AS Update 6, 32-bit and 64-bit
	Red Hat Enterprise Linux 4.0 AS Update 2, 32-bit and 64-bit
Sun Fire X4100 and X4200	Solaris x64 Version 10 HW1, 64 bit
	Solaris x64 Version 10 Update 1, 64 bit
	Red Hat Enterprise Linux 3.0 AS Update 5, 32-bit and 64-bit
	Red Hat Enterprise Linux 4.0 AS Update 1, 64-bit
Sun Fire V20z and V40z	Solaris x64 Version 10 HW1, 64 bit
	Solaris x64 Version 10 Update 1, 64 bit
	Red Hat Enterprise Linux 3.0 AS Updates 2 through 4, 32-bit and 64-bit, single core only
	Red Hat Enterprise Linux 3.0 AS Update 5, 32-bit and 64-bit
	Red Hat Enterprise Linux 4.0 AS Update 1, 32-bit and 64-bit

A minimum of 3.0 Gbytes should be allocated for each OS distribution you plan to provision.

- On a Solaris-based management server, OS distributions are stored as follows:
  - Linux OS distributions are stored in `/var/opt/SUNWscs/share/allstart`
  - Solaris OS distributions are stored in `/var/js`
- On a Linux-based management server, OS distributions are stored as follows:
  - Linux OS distributions are stored in `/var/opt/sun/scs/share/allstart/`
  - Solaris OS distributions are stored in `/var/opt/sun/scs/share/allstart/jumpstart/`

**Note** – If the server you have chosen for the management server has only two network interfaces, consider installing a third 10/100 or 10/100/1000 NIC in the N1 System Manager. A third NIC enables you to assign the management, provisioning, and data networks to separate network interfaces, and simplifies administrative tasks. The example diagrams and configurations in this document assume that an additional NIC has been installed in the management server.

## Manageable Server Requirements

N1 System Manager manageable server hardware and operating software requirements are listed in the following tables.

**TABLE 2-4** Manageable Server Disk Space and RAM Requirements

Disk Space	RAM
12 Gbytes minimum for all manageable servers	512 Mbytes minimum, 1 Gbyte recommended for all manageable servers

**TABLE 2-5** SPARC-Based Manageable Server Supported Hardware and Operating Systems

Type	Provisionable OS
Sun Netra 240 and 440	Solaris 10 GA and later
	Solaris 9 Update 7 and Update 8
Sun Fire V210, V240, and V440	Solaris 10 GA and later
	Solaris 9 Update 7 and Update 8
Sun Fire V490	Solaris 9 9/05
	Solaris 10 3/05
Sun Fire V890	Solaris 9 9/05
	Solaris 10 3/05
Sun Fire T1000 and T2000	Solaris 10 HW2 and later

TABLE 2-6 X86 and X64 Based Manageable Server Supported Hardware and Operating Systems

Type	Provisionable OS
Sun Fire V20z and V40z	Solaris x64 Version 10 HW1, 64 bit
	Solaris x64 Version 10 Update 1, 64 bit
	Red Hat Enterprise Linux 3.0 WS, ES, and AS, Updates 1 through 4, 32-bit and 64-bit, single core only
	Red Hat Enterprise Linux 3.0 WS, ES, and AS, Updates 5 through 6, 32-bit and 64-bit
	Red Hat Enterprise Linux 4.0 WS, ES, and AS, 32-bit, single core only
	Red Hat Enterprise Linux 4.0 WS, ES, and AS, update 1, 32-bit and 64 bit
	SUSE Linux Enterprise Server 9 SP1 and SP2, 64-bit
	SUSE Linux Enterprise Server 9 4/05 HW, 9/05, and 9/05 HW, 32 bit
	MS Windows 2003 SE, 2003 EE, 2003 WE 32-bit only
	Windows 2003 SE, 2003 EE 64-bit only
Sun Fire X2100 with the 8081A IPMI 1.5 Remote Management Card: Part Number: 371-0743	Windows 2000S, 2000AS 32-bit only
	Solaris x64 Version 10 HW1. 64 bit
	Solaris x64 Version 10 Update 1, 64 bit
	Red Hat Enterprise Linux 3.0 WS, ES, and AS Update 6 or greater, 32-bit and 64-bit
	Red Hat Enterprise Linux 4.0 WS, ES, and AS Update 2, 32-bit and 64-bit
	SUSE Linux Professional 9.2 and 9.3, 64-bit
	Windows 2003 SE, 2003 EE 64-bit
	Windows 2003 SE, 2003 EE, SP1 32-bit

**TABLE 2-6 X86 and X64 Based Manageable Server Supported Hardware and Operating Systems**  
(Continued)

Type	Provisionable OS
Sun Fire X4100 and X4200	Solaris x64 Version 10 HW1, 64 bit
	Solaris x64 Version 10 Update 1, 64 bit
	Red Hat Enterprise Linux 3.0 WS, ES, and AS, Update 5 and Update 6, 32-bit and 64-bit
	Red Hat Enterprise Linux 4.0 WS, ES, and AS Update 1 and Update 2, 64-bit
	SUSE Linux Enterprise Server 9 SP1 through SP3, 64 bit
	Windows 2003 SE, 2003 EE 64-bit
	Windows 2003 SE, 2003 EE, SP1 32-bit

**Note** – OS discovery, OS monitoring, and software update management are not supported for managed servers running the Windows operating system. For further information about OS discovery, see Chapter 4, “Discovering Manageable Servers,” in *Sun N1 System Manager 1.3 Discovery and Administration Guide*. For further information about OS monitoring, see Chapter 6, “Monitoring Servers and Server Groups,” in *Sun N1 System Manager 1.3 Discovery and Administration Guide*.

## Manageable Server Firmware Requirements

The following tables list the supported manageable server firmware versions by machine type. Refer to each server’s hardware documentation for firmware verification and upgrade procedures.

**Note** – You can also verify a managed server’s firmware version as described in “To List the Firmware Updates Installed on a Managed Server” in *Sun N1 System Manager 1.3 Operating System Provisioning Guide*. This requires that Sun N1 System Manager 1.3 has been installed and configured, and the server has been discovered.

**TABLE 2-7 SPARC-based Manageable Server Firmware Requirements**

Provisionable Server	Management Port	Minimum	Best Practice
Netra 240 and 440	ALOM	1.4	1.5.3
Sun Fire T1000	ALOM	6.1.0	6.1.1

**TABLE 2-7** SPARC-based Manageable Server Firmware Requirements *(Continued)*

Provisionable Server	Management Port	Minimum	Best Practice
Sun Fire T2000	ALOM	6.0.1	6.1.1
Sun Fire V210, V240, and V440	ALOM	1.4	1.5.3
Sun Fire V490 and V890	RSC	RSC 2.2.3	RSC 2.2.3 <a href="#">See “Managed Server Limitations” on page 24</a>
Sun Fire V490 and V890 RSCboot		2.2.2	2.2.2
Sun Fire V490 and V890 Open Boot Prom (OBP)		4.18.6	4.18.6

**TABLE 2-8** x86-based Manageable Server Firmware Requirements

Provisionable Server	Management Port	Minimum	Best Practice
Sun Fire V20z and V40z	SP	Service Processor: 2.1.0.5	Service Processor: 2.4.0.8
Sun Fire V20z BIOS		1.33.5.2	1.34.6.2
Sun Fire V40z BIOS		1.27.4	2.34.6.2
Sun Fire X2100	SP	4.0.9	4.11
Sun Fire X2100 BIOS		1.0.0	1.0.9 <a href="#">See “Managed Server Limitations” on page 24</a>
Sun Fire X4100 and X4200	ILOM	1.0.0	1.1
Sun Fire X4100 and X4200 BIOS		0ABGA022	0ABGA031
Sun Fire X4100 and X4200 SP		6464	9306

## Managed Server Limitations

This section lists managed server hardware and network configuration limitations.

- If your N1 System Manager provides only a management network or only a provisioning network, then the N1 System Manager operates in a restricted mode when installed. N1 System Manager provides two default security roles with specific privileges assigned for the restricted mode of operation. For further information, see:
  - [“Restricted Mode: Management Network Only” on page 37](#)
  - [“Restricted Mode: Provisioning Network Only” on page 38](#)
  - [“Managing Roles” in \*Sun N1 System Manager 1.3 Discovery and Administration Guide\*](#)
  - [“Restricted Mode Capabilities” in \*Sun N1 System Manager 1.3 Discovery and Administration Guide\*](#)
- Sun Fire V20z

If the V20z BIOS version is less than 1.33.5.2, then OS deployment will fail for a V20z that was discovered using OS type. Discovery cannot determine the server and platform type when the V20z BIOS version is less than 1.33.5.2.
- Sun Fire V490 and V890

The N1 System Manager serial console and firmware update features are not available for the V490 and V890 servers.
- Sun Fire X2100
  - The X2100 BIOS version 1.0.7 does not allow OS provisioning.
  - The N1 System Manager serial console and firmware update features are not available for the X2100 server.

## Microsoft Windows Image Server Requirements

If you plan to provision a Windows operating system to one or more managed servers, you must install and configure a Windows Remote Installation Services (RIS) server. The Windows RIS server must be running one of the following operating systems:

- Windows 2003 Server Enterprise edition with Service Pack 1 (32-bit edition only)
- Windows 2003 Server Standard edition with Service Pack 1 (32-bit edition only)

For information about installing and configuring a Windows RIS server, see [“Setting Up a Windows Remote Installation Services Server” on page 49](#).



## Recommended Switch Configuration

You can use a single VLAN-programmable switch to provide the management, provisioning, and data network infrastructure. However, for ease of management, you should install one VLAN-programmable switch for the management network, and a second VLAN-programmable switch for the provisioning and data network. Each management, provisioning, and data network should be assigned to separate subnets and VLANs.

---

**Note** – In order to support firmware updates for the Sun Fire V20z and V40z servers, the management network switch should be configured to auto-negotiate link speed.

---

Ethernet connectivity recommendations

- The management network should be a 10/100 connection.
- The provisioning and data networks should be a 10/100/1000 (1 Gbyte) connection.

Considerations:

- The management network should be on a private subnet to ensure security.
- The provisioning network should be on a private subnet to ensure security.
- The data network should be on a public subnet accessible by the management server, manageable servers, and the corporate network.

Due to the use of the DHCP protocol and the bandwidth requirements for OS provisioning, you might need to isolate the data network from the provisioning network.

- OS provisioning of Linux might fail if a delay occurs in the transmission of data between the management server and the manageable server. A long delay can result if the spanning tree option is enabled for the switch port connected to the manageable server port used for provisioning. To address this issue, you can disable the spanning tree option for the switch or for the switch ports connected to the manageable servers. Refer to your switch documentation for instructions about how to disable the spanning tree feature on your switch.

## Sun N1 System Manager Connection Information

This section provides the connectivity requirements for the Sun N1 System Manager servers.

### Management Server Connections

A SPARC or x86 based server can be used as the management server. Each server provides at least one 10/100/1000 (1-Gbit) network interface port, but adding additional Gbit network interface cards to the management server increases ease of management and physical separation of the corporate and provisioning networks. If you do not install additional NICs in your management server, you can configure your network to route the corporate and provisioning networks through a single 1-Gbit port as illustrated by the diagrams in [“Reference Configurations” on page 27](#).

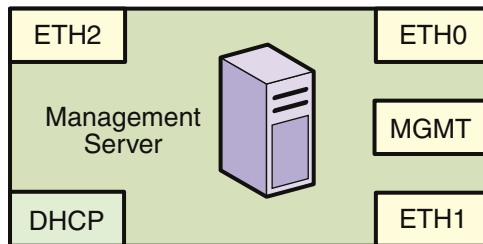
Each server also provides one or two system management ports depending on server architecture, labeled Net Mgmt (Network Management), ALOM (Advanced Lights Out Manager port), ILOM (Integrated Lights Out Manager port) on single management port manageable servers, and labeled SP0 and SP1 (Service Processor 1 and 2) on dual management port manageable servers. The management server requires only a single management port to provide connectivity with the corporate network. In this document, the management port is always shown as MGMT.

---

**Note** – Depending on the system architecture and the operating system installed, the operating system refers to the Ethernet ports by different names. For example, the first Ethernet port on a machine is referred to as ETH0, HME0, or BGE0 depending on the operating system. This document refers to the lowest order Ethernet port on a machine as ETH0, the next port as ETH1 and so on regardless of architecture and operating system.

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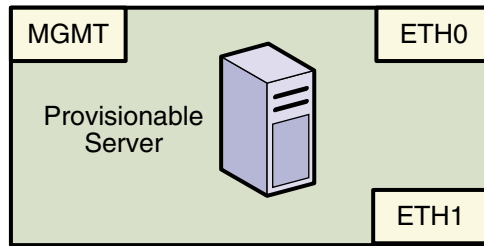
The following illustration provides the logical diagram for a management server with three 1-Gbyte NICs, and is used in subsequent sections to illustrate the reference architecture diagrams.



## Manageable Server Connections

A SPARC or x86-based server can be used as a manageable server as described in [“Management Server Requirements” on page 18](#). Each server provides one or two 10/100/1000 network interface ports. Each server also provides one or two system management ports depending on server architecture, labeled ALOM or ILOM on single management port manageable servers, and labeled SP0 and SP1 on dual management port manageable servers. In this document, the management port is always shown as MGMT.

The following illustration provides the logical diagram for a manageable server with two 1-Gbyte NICs, and is used in subsequent sections to illustrate the reference architecture diagrams.



## Reference Configurations

This section provides reference configuration diagrams and connectivity information that will assist you in designing and connecting your N1 System Manager equipment.

Other configurations are possible, such as using separate switches for each network. You can implement your network using any combination of VLANs and switches. Each network, whether management, provisioning or data, should be assigned to separate VLANs.

---

**Note** – In each of the following reference configurations, corporate access is shown as a connection to the management server. Alternatively, corporate access to the N1 System Manager can be provided through a switch instead of the management server.

---

## Separate Management, Provisioning, and Data Networks

This section provides reference configuration diagrams and connectivity information that will assist you in designing and connecting your N1 System Manager equipment.

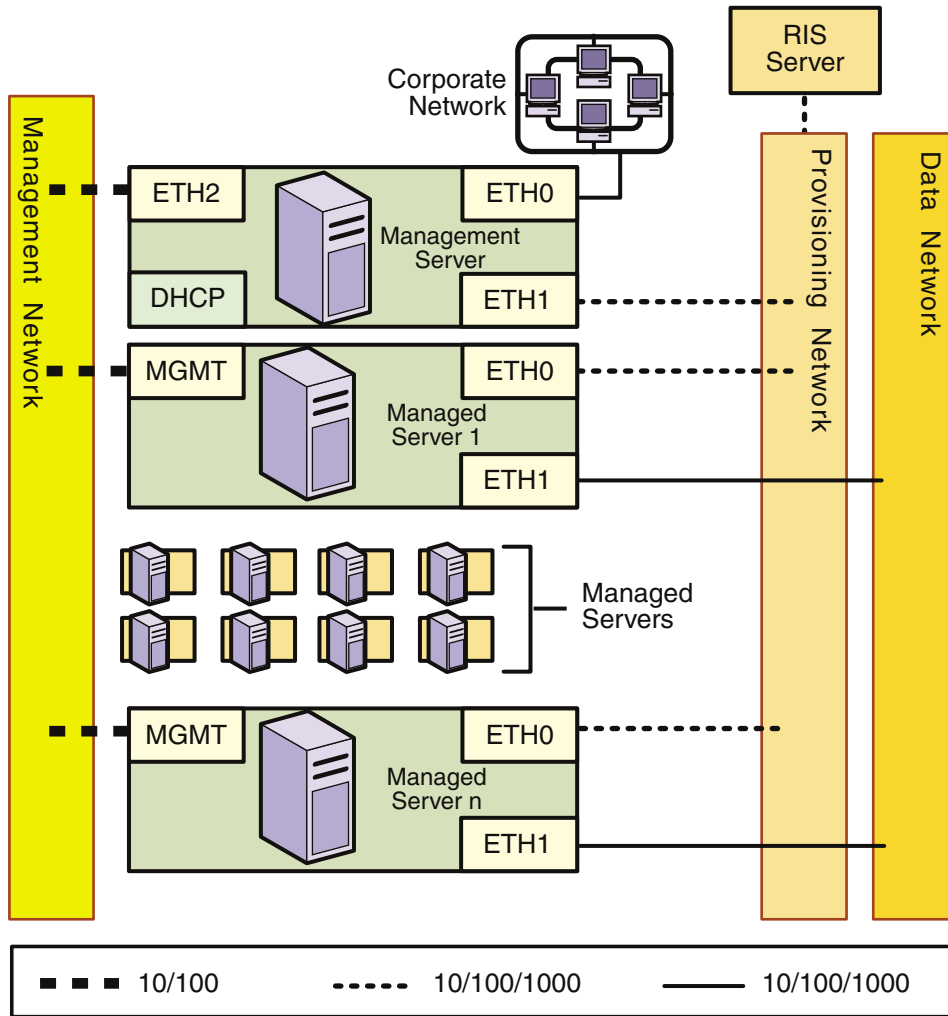


FIGURE 2-1 Separate Management, Provisioning, and Data Networks

When designing a network, keep the following information in mind:

- Configuring separate management, provisioning, and data networks is the best practice
- Separate networks provide the highest security and the lowest number of points of failure
- The data center DHCP service can be used to assign IP addresses to managed servers

---

**Note** – The management server DHCP service does not provide DHCP services for the data network. If you plan to dynamically configure IP services on the data network, you must provide an external DHCP server for the data network. You must not have another DHCP server on the same provisioning network.

---

- You might need to install additional NICs in the management server and some manageable servers to support this configuration

The following list summarizes the connectivity requirements for the separate management, provisioning, and data networks configuration.

- **Management Server**

The management server should provide connectivity to the management network, provisioning network, and corporate network as follows:

- ETH0 connects the management server to the corporate network to provide external access to the management server. The management server ETH0 IP address, netmask, and gateway should be configured to meet your corporate environment connectivity requirements.
- ETH1 connects the management server to the provisioning network and should be on the same network as the ETH0 connections of the manageable servers. . No devices other than the management server and the manageable servers should reside on the provisioning network. ETH1 should be a 1-Gbit NIC interface.
- ETH2 connects the management server to the management network and should be on the same network as the management port connections of the manageable servers. The management server ETH2 IP address, netmask, and gateway should be configured to enable connectivity to the manageable server’s management port IP addresses. ETH2 should be a 100-megabit NIC interface.
- The management server DHCP service allocates IP addresses to the manageable servers for loading operating systems.

- **Manageable Servers**

Each manageable server should provide connectivity to the management network, provisioning network, and data network as follows:

- The management port connects the manageable server to the management network and should be on the same network as the ETH2 connection of the management server. The management port should be a 100-megabit connection.
  - ETH0 connects the manageable server to the provisioning network and must be on the same network as the ETH1 connection of the management server. ETH0 should be a 1-Gbyte connection.
  - ETH1 connects the manageable server to the data network through the switch to provide external corporate network access to the manageable server. ETH1 should be a 1-Gbyte connection.
- The RIS server is required only if you plan to provision Microsoft Windows. The RIS server should be connected to the provisioning network using a 1-Gbyte connection.

## Combined Management and Provisioning Network, and a Separate Data Network

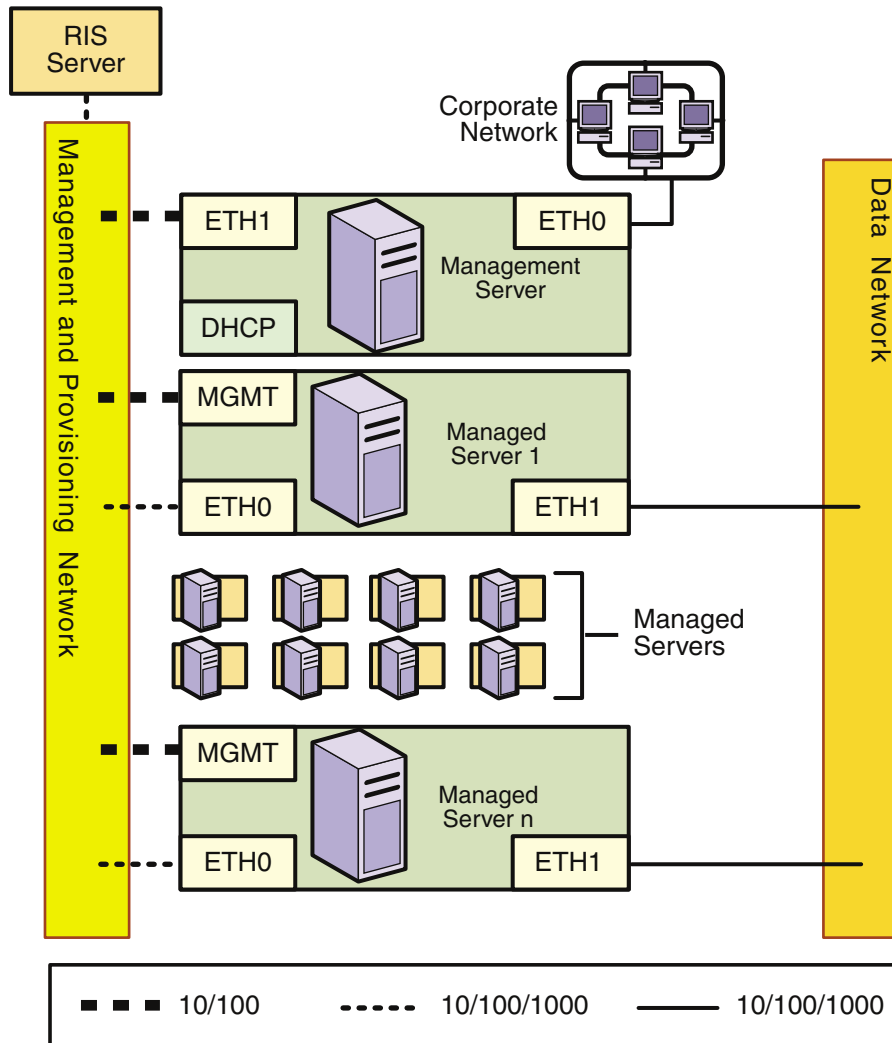


FIGURE 2-2 Combined Management and Provisioning Networks, and a Separate Data Network

For this configuration:

- An additional NIC does not need to be installed on the management server
- The combined management and provisioning network reduces system and network security

- The data center DHCP service can be used to assign IP addresses to provisioned servers

---

**Note** – The management server DHCP service does not provide DHCP services for the data network. If you plan to dynamically configure IP services on the data network, you must provide an external DHCP server for the data network. You must not have another DHCP server on the management and provisioning network.

---



---

**Caution** – The statically-assigned management IP addresses and the dynamically assigned IP addresses used during OS provisioning are part of the same network. The N1 System Manager does not manage IP addresses. You must ensure that the IP addresses used during provisioning do not conflict with the management network IP addresses.

---

The following list summarizes the connectivity requirements for the combined management and provisioning network and the separate data network configuration.

- **Management Server**

The management server should provide connectivity to the management and provisioning network as follows:

- ETH0 connects the management server to the corporate network to provide external access to the management server. The management server ETH0 IP address, netmask, and gateway should be configured to meet your corporate environment connectivity requirements.
- ETH1 connects the management server to the management and provisioning network and should be on the same network as the MGMT and ETH0 connections of the manageable servers. No devices other than the management server and the manageable servers should reside on the management and provisioning network. The management server ETH1 IP address, netmask, and gateway should be configured to enable connectivity to the manageable server's management port IP addresses. ETH1 should be a 1-Gbit NIC interface.
- The management server DHCP service allocates IP addresses to the manageable servers for loading operating systems.

- **RIS Server**

The RIS server connects to the provisioning network. The connection must be from the first (lowest order) Ethernet port on the RIS server, and should be a 1-Gbit interface.

- **Manageable Servers**

Each manageable server should provide connectivity to the management and provisioning network and the separate data network as follows:

- The management port connects the manageable server to the management and provisioning network and should be on the same network as the ETH1 connection of the management server. The management port should be a 100-megabit connection.

- ETH0 connects the manageable server to the management and provisioning network and must be on the same network as the ETH1 connection of the management server. ETH0 should be a 1-Gbyte connection.
- ETH1 connects the manageable server to the data network through the switch to provide external corporate network access to the manageable server. ETH1 should be a 1-Gbyte connection.
- The RIS server is required only if you plan to provision Microsoft Windows. The RIS server should be connected to the management and provisioning network using a 1-Gbyte connection.

## **Combined Provisioning and Data Network, and a Separate Management Network**



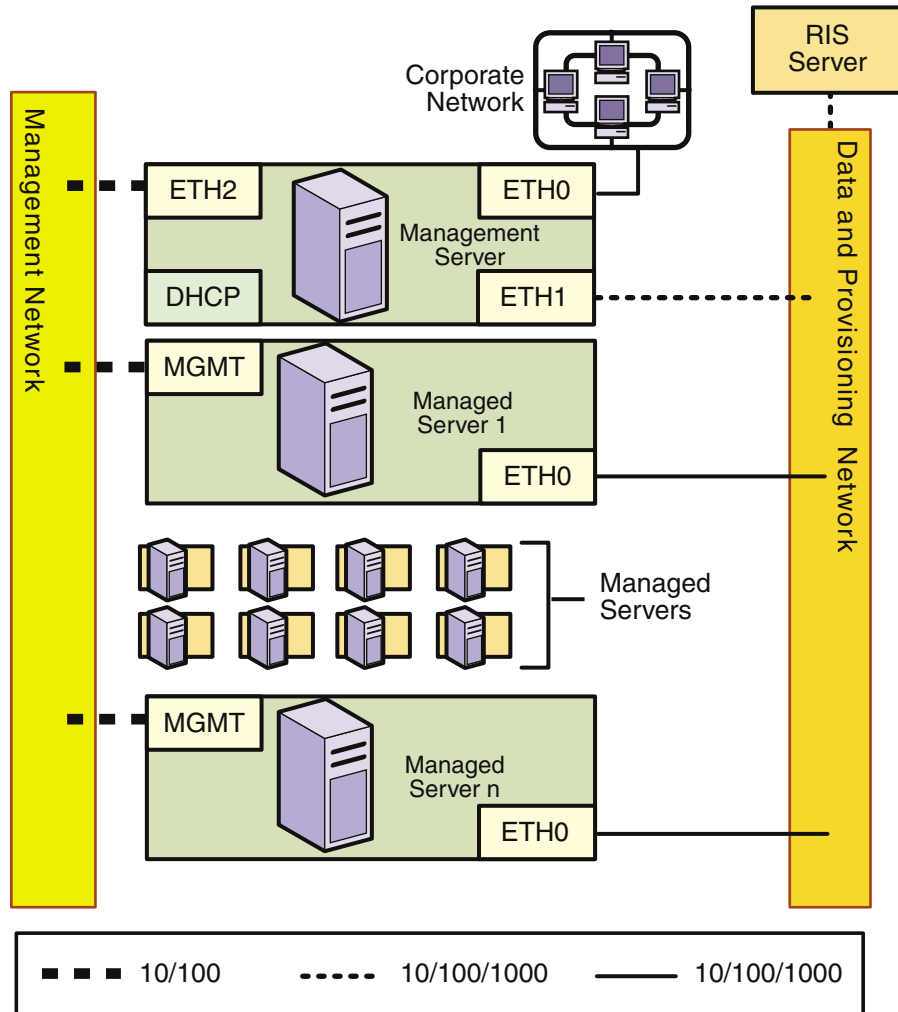


FIGURE 2-3 Combined Provisioning and Data Network, and a Separate Management Network

For this configuration:

- The combined provisioning and data network reduces system and network security
- The data network must use the N1 System Manager DHCP service



**Caution** – The N1 System Manager DHCP service must be the only DHCP service on the data network.

The following list summarizes the connectivity requirements for the combined data and provisioning network and the separate management network configuration.

- Management Server

The management server should provide connectivity to the provisioning and data network and to the separate management network as follows:

- ETH0 connects the management server to the corporate network to provide external access to the management server. The management server ETH0 IP address, netmask, and gateway should be configured to meet your corporate environment connectivity requirements.
- ETH1 connects the management server to the provisioning and data network and should be on the same network as the ETH0 connections of the manageable servers. No devices other than the management server and the manageable servers should reside on the data and provisioning network. ETH1 should be a 1-Gbit NIC interface.
- ETH2 connects the management server to the management network and should be on the same network as the management port connections of the manageable servers. The management server ETH2 IP address, netmask, and gateway should be configured to enable connectivity to the manageable server's management port IP addresses. ETH2 should be a 100-megabit NIC interface.
- The management server DHCP service allocates IP addresses to the manageable servers for loading operating systems.

- RIS Server

The RIS server connects to the provisioning network. The connection must be from the first (lowest order) Ethernet port on the RIS server, and should be a 1-Gbit interface.

- Manageable Servers

Each manageable server should provide connectivity to the management network and to the combined data and provisioning network as follows:

- The management port connects the manageable server to the management network and should be on the same network as the ETH2 connection of the management server. The management port should be a 100-megabit connection.
  - ETH0 connects the manageable server to the data and provisioning network to enable deployment of an operating system to the manageable server, and to provide external corporate network access to the manageable server. The manageable server ETH0 connection must be on the same network as the ETH1 connection of the management server. ETH0 should be a 1-Gbyte connection.
- The RIS server is required only if you plan to provision Microsoft Windows. The RIS server should be connected to the data and provisioning network using a 1-Gbyte connection.

## Combined Provisioning, Data, and Management Network

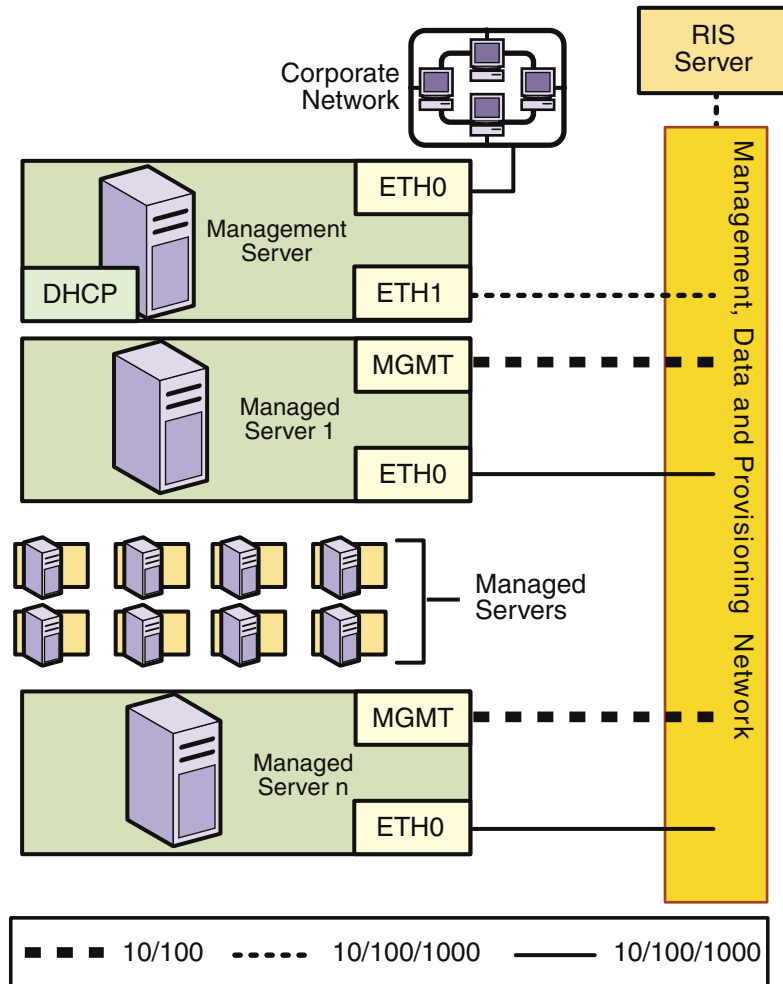


FIGURE 2-4 Combined Provisioning, Data, and Management Network

For this configuration:

- An additional NIC does not need to be installed on the management server
- The combined management, provisioning, and data networks greatly reduces system and network security
- The data network must use the N1 System Manager DHCP service



---

**Caution** – The N1 System Manager DHCP service must be the only DHCP service on the data network.

---

The following list summarizes the connectivity requirements for the combined management, provisioning, and data networks configuration.

- **Management Server**

The management server should provide connectivity to the combined management, provisioning, and data network and to the corporate network as follows.

- ETH0 connects the management server to the corporate network to provide external access to the management server. The management server ETH0 IP address, netmask, and gateway should be configured to meet your corporate environment connectivity requirements.
- ETH1 connects the management server to the combined management, provisioning, and data network and should be on the same network as the MGMT and ETH0 connections of the manageable servers. No devices other than the management server and the manageable servers should reside on the combined network. ETH1 should be a 1-Gbit NIC interface.
- The management server DHCP service allocates IP addresses to the manageable servers for loading operating systems.

- **RIS Server**

The RIS server connects to the provisioning network. The connection must be from the first (lowest order) Ethernet port on the RIS server, and should be a 1-Gbit interface.

- **Manageable Servers**

Each manageable server should provide connectivity to the management network, provisioning network and data network as follows:

- The management port connects the manageable server to the management, provisioning, and data network and should be on the same network as the ETH1 connection of the management server. The management port should be a 100-megabit connection.
  - ETH0 connects the manageable server to the management, provisioning, and data network, and must be on the same network as the ETH1 connection of the management server. ETH0 also connects the manageable server to the data network through the switch to provide external corporate network access to the manageable server. ETH0 should be a 1-Gbyte connection.
- The RIS server is required only if you plan to provision Microsoft Windows. The RIS server should be connected to the management, provisioning, and data network using a 1-Gbyte connection.

## Restricted Mode: Management Network Only

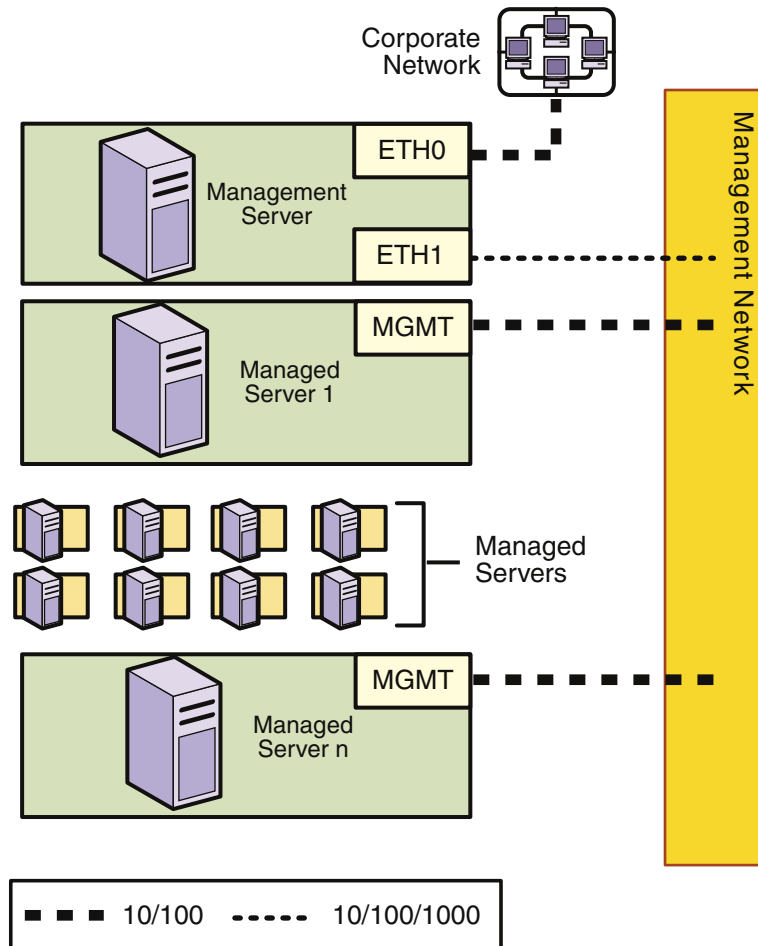


FIGURE 2-5 Restricted Mode: Management Network Only

For this configuration:

- An additional NIC does not need to be installed on the management server.
- N1 System Manager provides two default security roles with specific privileges assigned for the restricted mode of operation. For more information, see “Managing Roles” in *Sun N1 System Manager 1.3 Discovery and Administration Guide* and “Restricted Mode Capabilities” in *Sun N1 System Manager 1.3 Discovery and Administration Guide*.
- Management Server

ETH1 connects the management server to the management network and should be on the same network as the MGMT connections of the manageable servers. The management server ETH1 IP address, netmask, and gateway should be configured to enable connectivity to the manageable servers management port IP addresses. No devices other than the management server and the manageable servers should reside on the provisioning network. ETH1 should be a 1-Gbit NIC interface.

- Manageable Servers

Each manageable server should provide connectivity to the management network as follows:

The management port connects the manageable server to the management network and should be on the same network as the ETH1 connection of the management server. The management port should be a 100 megabit NIC connection.

## **Restricted Mode: Provisioning Network Only**

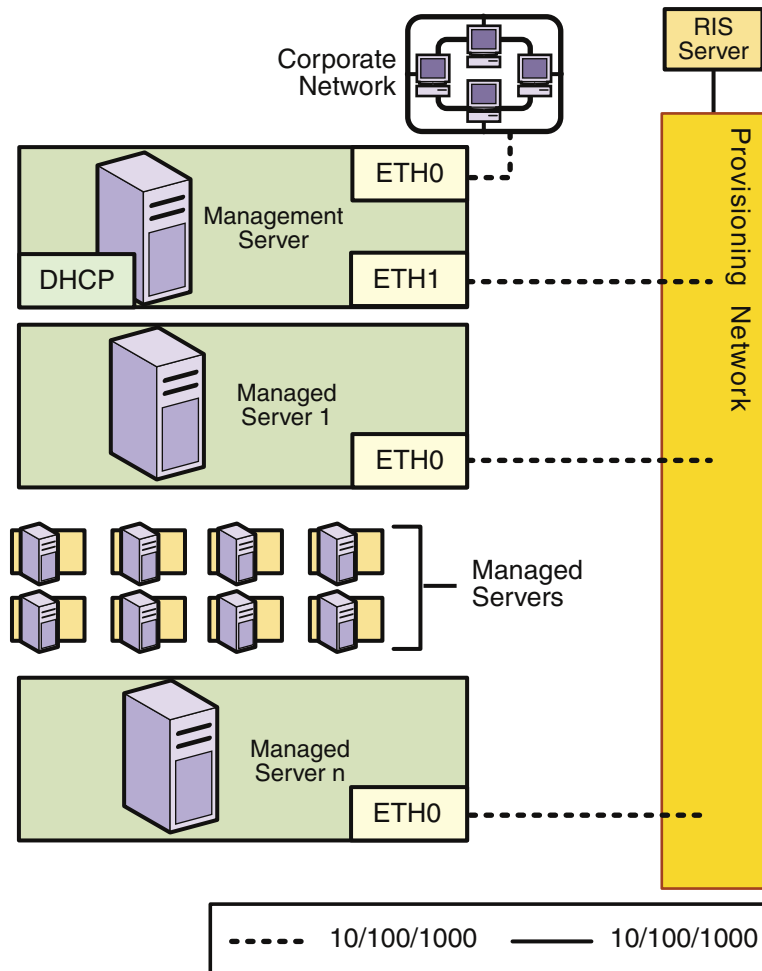


FIGURE 2-6 Restricted Mode: Provisioning Network Only

For this configuration:

- An additional NIC does not need to be installed on the management server.
- N1 System Manager provides two default security roles with specific privileges assigned for the restricted mode of operation. For more information, see “Managing Roles” in *Sun N1 System Manager 1.3 Discovery and Administration Guide* and “Restricted Mode Capabilities” in *Sun N1 System Manager 1.3 Discovery and Administration Guide*.

The following list summarizes the connectivity requirements for the management network only configuration.

- Management Server

- ETH0 connects the management server to the corporate network to provide external access to the management server. The management server ETH0 IP address, netmask, and gateway should be configured to meet your corporate environment connectivity requirements.
- ETH1 connects the management server to the provisioning network and should be on the same network as the ETH0 connections of the manageable servers. No devices other than the management server and the manageable servers should reside on the provisioning network. ETH1 should be a 1-Gbit NIC interface.
- The management server DHCP service allocates IP addresses to the manageable servers for loading operating systems.
- RIS Server  
The RIS server connects to the provisioning network. The connection must be from the first (lowest order) Ethernet port on the RIS server, and should be a 1-Gbit interface.
- Manageable Servers  
Each manageable server should provide connectivity to the provisioning network as follows:  
ETH0 connects the manageable server to the provisioning network, and must be on the same network as the ETH1 connection of the management server.  
ETH0 should be a 1-Gbyte connection.
- The RIS server is required only if you plan to provision Microsoft Windows. The RIS server should be connected to the management, provisioning, and data network using a 1-Gbyte connection.

## Site Planning

This section provides guidelines for determining your management server and switch needs. The following topics are discussed:

- [“Management Server Considerations” on page 40](#)
- [“Switch Considerations” on page 42](#)

## Management Server Considerations

Hard drive capacity and the number of manageable servers to be managed are the primary considerations for your management server.

- Hard drive capacity is affected by two factors: the number of OS distributions that are to be provisioned, and the log files generated by N1 System Manager. OS distributions are stored in the /var file hierarchy on the management server. Allocate 3 Gbytes for each OS distribution and its associated profiles and scripts.

Sufficient disk space should also be allocated for the N1 System Manager event logs. Log file size depends on how you set up event monitoring and the amount of detail chosen for each log. The `n1smconfig` utility is used to configure logging during initial N1 System Manager configuration,



and can subsequently be used after the system is in production to reconfigure logging. For further information, see Chapter 6, “Monitoring Servers and Server Groups,” in *Sun N1 System Manager 1.3 Discovery and Administration Guide*.

- System processing is affected by three major factors: The number of managed servers being managed, the types of monitoring being performed on the managed servers, and the number of jobs running on the management server.

The following table provides sizing guidelines for the management server.

**TABLE 2–9** Management Server Hardware Sizing Guidelines

<b>Small scale deployment: 1 to 128 managed servers</b>	
Total number of processors	1 or more single-core AMD Opteron processors 1 or more 1x1 Ghz Ultra SPARC IIIi minimum
Total memory	4 Gbytes minimum
Total file system space	72 Gbytes minimum
Media	1 DVD ROM drive
Qualified Models	Sun Fire V20z, V40z, X2100, X4100, X4200, V210, V240, V440, V490, and T1000
Sample Configuration	Sun Fire V20z Single Processor (single-core) Opteron processor, 4 GB RAM, 1x72 GB HDD, DVD ROM Drive
<b>Medium scale deployment: 129 to 256 managed servers</b>	
Total number of processors	2 or more single-core AMD Opteron processors, or 1 or more dual-core AMD Opteron processors 2 or more 1x1 Ghz Ultra SPARC IIIi minimum
Total memory	8 Gbytes minimum
Total file system space	144 Gbytes minimum
Media	1 DVD ROM drive
Qualified Models	Sun Fire V20z, V40z, X4100, X4200, V210, V240, V280, V440, V490, and T2000
Sample Configuration	Sun Fire V40z Dual Processor (dual-core), 8 GB RAM, 1x146 GB HDD, DVD ROM Drive
<b>Large scale deployment: 257 to 512 managed servers</b>	
Total number of processors	4 single-core AMD Opteron processors, or 2 or more dual-core AMD Opteron processors 4 1x1 Ghz Ultra SPARC IIIi minimum

**TABLE 2-9** Management Server Hardware Sizing Guidelines *(Continued)*

---

Total memory	16 Gbytes minimum
Total file system space	300 Gbytes minimum
Media	1 DVD ROM drive
Qualified Models	Sun Fire V40z, V490, X4100, X4200, V440, and T2000
Sample Configuration	Sun Fire V40z Dual Processor (dual-core), 16 GB RAM, 1x300 GB HDD, DVD ROM Drive

---

## Switch Considerations

Switch requirements are determined by the following factors:

- Whether you have added a third 1-Gbit NIC to the management server
- The number of management ports on each manageable server
- The number of manageable servers to be connected to the switch

The Sun Fire V20z and V40z servers have two management ports, and subsequently can be daisy-chained. For further information, see [Appendix A](#).

- The network topology you have chosen

The following worksheet can assist you in determining the total number of switch ports by type that you will need on your switch or switches.

TABLE 2-10 Switch Port Requirements Worksheet

Server Type	10/100 Ports	10/100/1000 Ports
<b>Management Server</b>		
<ul style="list-style-type: none"> <li>■ Separate management network and provisioning network: Enter 1 in the 10/100 column. If you have not installed a third 1-Gbit NIC in the management server, enter 1 in the 10/100/1000 port column. If you have installed a third 1-Gbit NIC, enter 2 in the 10/100/1000 column.</li> <li>■ Management network only: Enter 1 in the 10/100 column.</li> <li>■ Provisioning network only: Enter 1 in the 10/100/1000 column.</li> </ul>	Total: _____	Total: _____
<b>RIS Server</b>		
Enter 1 in the 10/100/1000 column only if you have a provisioning network.		
<b>Manageable Servers</b>		
<ul style="list-style-type: none"> <li>■ Separate management, provisioning, and data networks: Total the number of manageable servers and enter that number in the 10/100 column Double the number of manageable servers and enter that number in the 10/100/1000 column.</li> <li>■ Separate management network, and combined data and provisioning networks: Total the number of manageable servers and enter that number in the 10/100 column and in the 10/100/1000 column.</li> <li>■ Combined management, provisioning, and data networks: Double the number of manageable servers and enter that number in the 10/100/1000 column.</li> <li>■ Management network only: Total the number of manageable servers and enter that number in the 10/100 column only.</li> <li>■ Provisioning network only: Total the number of manageable servers and enter that number in the 10/100/1000 column only.</li> </ul>	Total: _____	Total: _____

**TABLE 2-10** Switch Port Requirements Worksheet *(Continued)*

Server Type	10/100 Ports	10/100/1000 Ports
10/100/100 connection for the corporate network:		Total: 1
Total the number of ports for each column:	10/100 ports: Total: _____	10/100/1000 ports: Total: _____

Use the above totals to determine your switch requirements, and then connect the servers and switches according to your site plan.

## Setting Up Manageable Servers

Before you can use the N1 System Manager to discover manageable servers, each manageable server must be set up as follows:

- An IP address must be assigned to each manageable server's management port.
  - For ILOM, ALOM, and SP-based manageable servers, refer to the server documentation for the server's management port IP address assignment procedure. You can also locate the server documentation online at [http://sunsolve.sun.com/handbook\\_pub/Systems/](http://sunsolve.sun.com/handbook_pub/Systems/).
  - For RSC-based manageable servers, assign an IP address to each server as described in “To Configure the RSC IP Address and Credentials” on page 47.
- Management processor account credentials must be configured on each manageable server.
  - For ALOM-based manageable servers, refer to the server documentation for the server's management port telnet configuration procedure.
  - For SP and ILOM-based manageable servers, refer to the server documentation for the server's management port ssh and IPMI configuration procedures.
  - For RSC—based manageable servers, assign credentials to each server's RSC and redirect the server's console to the RSC as described in “To Configure the RSC IP Address and Credentials” on page 47.

Discovery of a manageable server will fail if the server's management port has not been configured.

## SPARC Architecture Manageable Server Credentials

If you do not specify the management server management port credentials when running discovery, the discovery process will use the default credentials shown in the following table.

TABLE 2-11 SPARC Architecture Manageable Server Default Credentials

Server Type	Management Port Type	Telnet Login	Telnet Password
Netra 240 and 440	ALOM	admin	admin
Sun Fire V210, V240, and V440	ALOM	admin	admin
Sun Fire V490, V890	RSC	admin	n1smadmin
Sun Fire T1000 and T2000	ALOM	admin	admin

To manage RSC-based manageable servers, you must first configure the RSC credentials and the Online Boot Prom (OBP) as described in “[Preparing RSC-based Manageable Servers](#)” on page 46.

## x86 Architecture Manageable Server Credentials

If you do not specify the management server management port credentials when running discovery, the discovery process will use the default credentials shown in the following table.

TABLE 2-12 x86 Architecture Manageable Server Default Credentials

Server Type	Management Port Type	SSH Login	SSH Password	IPMI Login	IPMI Password	SNMP Read Community String
Sun Fire V20z and V40z	SP	admin	admin	-	admin	public
Sun Fire X2100	SP	-	-	Admin	admin	-
Sun Fire X4100 and X4200	ILOM	root	changeme	root	changeme	public

If only one credential is specified during discovery for x86 architecture manageable servers, the missing credential is configured with one of the defaults specified above.

Automatic configuration of credentials during discovery is supported for Sun Fire V20z and V40z servers if they are in the factory default state. If you do specify the login accounts and passwords for discovery of a Sun Fire V20z or V40z, the discovery process configures the Sun Fire V20z or V40z using the credentials you provide.

Although the Sun Fire X2100 does not support SNMP, the X2100 does support IPMI platform event trap (PET), which generates SNMP V1 traps for IPMI events. The N1 System Manager listens for the X2100 IPMI events.

## Preparing RSC-based Manageable Servers

The Sun Fire V490 and V890 RSC IP address and credentials, are configured by running configuration utilities from the Solaris root command line prompt on the server. The servers are shipped with Solaris pre-installed. Configuration of the Online Boot Prom (OBP) is done using a telnet session to the RSC.

Preparation of an RSC-based manageable server is comprised of the following tasks:

- “To Download and Update the RSC Utilities” on page 46
- “To Configure the RSC IP Address and Credentials” on page 47
- “To Redirect the Server’s Console to the RSC and Configure the OBP” on page 48

### ▼ To Download and Update the RSC Utilities

#### Before You Begin

Assign an IP address, netmask and gateway to the server. You must download the RSC utilities version 2.2.3 or later to the server and run the utilities before you can configure the server’s RSC.

#### 1 Log in as root to the V490 or V890 manageable server.

#### 2 Download the RSC version 1.2.3 utilities zip file.

Go to <http://www.sun.com/servers/rsc.html>. Download the zip file appropriate for the Solaris operating system installed on the server:

- Solaris 9 or later: rsc2.2.3\_packages\_s9.zip
- Solaris 8: rsc2.2.3\_packages\_s8.zip

When the download has completed, unzip the file to a temporary directory, and then change directory to the temporary directory.

#### 3 Install the RSC version 2.2.3 packages on the manageable server.

Install the following packages on the server using the pkgadd command:

- SUNWrsc - the RSC base package for installation on the host machine
- SUNWrscd - the RSC documentation package
- SUNWrscj - the RSC GUI package to display the RSC GUI

If you are asked whether to install conflicting files, type **Y** to override the existing version.

For example:

```
# pkgadd -d . SUNWrsc
```

```
The following files are already installed on the system and are being
used by another package:
```

```
  /usr <attribute change only>
```

```
Do you want to install these conflicting files [y,n,?,q] y
```

```
## Checking for setuid/setgid programs
```

```

Installing Remote System Control as <SUNWrsc>
.
.
.
Installation of <SUNWrsc> was successful
# pkgadd -d . SUNWrscd

Processing package instance <SUNWrscd>
.
.
.
Installation of <SUNWrscd> was successful
# pkgadd -d . SUNWrscj

Processing package instance <SUNWrscj>
.
.
.
Installation of <SUNWrscj> was successful

```

**Next Steps** Configure the server's RSC as described in the next procedure.

## ▼ To Configure the RSC IP Address and Credentials

The Sun Fire V490 and V890 RSC credentials are configured by running configuration utilities from the Solaris root command line prompt on the server. The servers are shipped with Solaris pre-installed.

This procedure describes only the information required by the N1 System Manager. For detailed information about the RSC configuration utility, see the *Sun Remote System Control (RSC) 2.2 User's Guide* at <http://docs.sun.com/source/816-3314-12> and the *Sun Remote System Control (RSC) 2.2.3 Release Notes* at <http://docs.sun.com/source/819-2022>.

**Before You Begin** RSC Configuration Utilities version 2.3.3 must be installed on the server as described in “[To Download and Update the RSC Utilities](#)” on page 46

- 1 **Log in as root on the RSC-based manageable server.**
- 2 **Run the RSC configuration utility.**
  - If you are configuring a V490 server, type  
`/usr/platform/SUNW,Sun-Fire-V490/rsc/rsc-config.`
  - If you are configuring a V890 server, type  
`/usr/platform/SUNW,Sun-Fire-V890/rsc/rsc-config.`

Respond to each prompt according to the requirements of your network, except for the RSC user account prompts:

- When prompted for the RSC user account, type **admin**.
- When prompted for the RSC user account password, type **n1smadmin**.
- When prompted for the RSC user privileges, type **cuar**.

**Next Steps** Redirect the server console to the RSC, and configure the Online Boot Prom (OBP) settings.

## ▼ To Redirect the Server's Console to the RSC and Configure the OBP

The Sun Fire V490 and V890 RSC credentials are configured by running configuration utilities from the Solaris root command line prompt on the server. The servers are shipped with Solaris pre-installed.

This procedure describes only the information required by the N1 System Manager. For detailed information about console redirection on an RSC-based server and OBP configuration, see the *Sun Remote System Control (RSC) 2.2 User's Guide* at <http://docs.sun.com/source/816-3314-12> and the *Sun Remote System Control (RSC) 2.2.3 Release Notes* at <http://docs.sun.com/source/819-2022>.

- Before You Begin**
- RSC Configuration Utilities version 2.3.3 must be installed on the server as described in “[To Download and Update the RSC Utilities](#)” on page 46.
  - The RSC must be configured as described in “[To Configure the RSC IP Address and Credentials](#)” on page 47.

- 1 **Log on to the manageable server's RSC using the command `telnet IP address` where *IP address* is the address you assigned to the RSC.**
- 2 **Redirect the server's console to the RSC as described in the *Sun Remote System Control (RSC) 2.2 User's Guide* at <http://docs.sun.com/source/816-3314-12>.**
- 3 **Configure the server's OBP as described in the *Sun Remote System Control (RSC) 2.2 User's Guide* at <http://docs.sun.com/source/816-3314-12>.**

Ensure the following environment variables are set to the values shown:

OBP Environment Variable	Value
local-mac-address?	true
output-device	rsc-console
input-device	rsc-console
diag-device	disk
diag-script	none
diag-level	off
diag-switch?	false



For example:

```
> setenv local-mac-address? true
> setenv output-device rsc-console
```

To verify the settings, type `printenv`.

## Setting Up a Windows Remote Installation Services Server

The N1 System Manager OS provisioning process uses the Microsoft Remote Installation Services (RIS) technology to provision Windows operating systems to manageable servers from a RIS server. To provision Windows operating systems to manageable servers, you must set up a RIS server that is accessible to the N1 System Manager as described in the following sections. For more information about RIS, see the Microsoft RIS documentation at <http://www.microsoft.com/technet/prodtechnol/windowsserver2003/library/ServerHelp/c62e5951-5eb9-42f1-95ae-490e5d7a5551.msp>.

Setting up the Windows RIS server consists of the following tasks:

- “To Set Up the Windows RIS Server” on page 49
- “To Set the BIOS Boot Order on a Manageable Server” on page 52
- “To Set Up a Windows Image on the Windows RIS Server” on page 50

### ▼ To Set Up the Windows RIS Server

#### 1 Install Windows 2003 Enterprise Edition operating system for 32-bit systems with Service Pack 1 on the Windows RIS server.

Create a separate NTFS partition that contains 800 Mbytes for each Windows operating system image that you want to provision. The Windows OS image partition should be on a drive or logical partition other than the C: drive. You will be prompted for the partition information when you configure the N1 System Manager.

---

**Note** – If you already have a machine that is running Windows 2003 Server 32-bit Enterprise edition without Service Pack 1, you can install just the Windows 2003 Service Pack 1 on the server. See [Microsoft Knowledge Base Article #891128](http://support.microsoft.com/default.aspx?scid=kb;en-us;891128) (<http://support.microsoft.com/default.aspx?scid=kb;en-us;891128>).

---

#### 2 Install and configure Active Directory Server on the RIS server.

During installation of Active Directory Server software on your RIS server, identify your RIS server as a domain controller. For information about Active Directory Server, see [Microsoft Knowledge Base Article 324753](http://support.microsoft.com/default.aspx?scid=kb;en-us;324753) (<http://support.microsoft.com/default.aspx?scid=kb;en-us;324753>).

**3 Install and configure the RIS server software on the RIS server.**

For more information, see [Microsoft Knowledge Base Article 325862](http://support.microsoft.com/default.aspx?scid=kb;en-us;325862) (<http://support.microsoft.com/default.aspx?scid=kb;en-us;325862>).

---

**Note** – While installing RIS server, add a Windows 2003 x64 `RiSetup.exe` image or the Windows 2003-Service Pack 1 x86 `RiSetup.exe` image on the RIS server.

If the Windows Server 2003 SP1 R1SETUP image is the first image to be uploaded to the RIS server, the new OS chooser screen (`x8664.osc`) is copied to the RIS server by default.

If there are existing Windows OS images on the RIS server at the time the first Windows Server 2003 SP1 image is added, you must choose whether to overwrite (or backup and overwrite) the OS chooser screens during the installation to get the new screen. See [Microsoft Knowledge Base Article #891128](http://support.microsoft.com/default.aspx?scid=kb;en-us;891128) (<http://support.microsoft.com/default.aspx?scid=kb;en-us;891128>).

---

**4 Install Cygwin® on the RIS Server and configure Open Secure Shell Service (OpenSsh service) for Windows 2003 on the RIS server as `n1smssh` user.**

For more information, see the [Cygwin Home Page](#) and the [Open Ssh Windows Install Instructions](#). For information about removing existing Cygwin packages, see [http://cygwin.com/faq/faq\\_2.html#SEC20](http://cygwin.com/faq/faq_2.html#SEC20).

The Cygwin install source is located in the `install media\windows` directory.

## ▼ To Set Up a Windows Image on the Windows RIS Server

**1 Log onto the Windows RIS server using the administrator account or an account with administrator privileges.**

**2 Copy the Windows distribution from a CD or Network Share to the RIS server CIFS.**

On the RIS server, copy the windows distribution either from a CD or Network Share using the `RiSetup.exe` utility with the `-add` option onto the RIS Server Common Internet File System (CIFS) share.

---

**Note** – Make sure you select the option “Keep the old existing OSC files” in the `ris` setup wizard while creating RIS images.

When you copy a Windows distribution to the RIS server, the appropriate Windows drivers are copied automatically. To add other drivers into the distribution, copy the drivers into the `scripts` directory on the RIS server.

Do not use the Microsoft Developers Network (MSDN) Combination CDs to create a RIS Image. RIS image creation will fail, and you will get an error message that is described in the [Microsoft Knowledge Base Article #300556](http://support.microsoft.com/default.aspx?scid=kb;en-us;300556) (<http://support.microsoft.com/default.aspx?scid=kb;en-us;300556>). To resolve this issue, use a retail version of the OS image being created.

---

To create a RIS image of a Windows distribution integrated with service packs, follow the procedures described in the following articles:

- How to create a RIS image with the service pack bundled is explained in [Service Pack 3 Installation and Deployment Guide for Windows 2000 Server edition](#). Similar guides can be found in Microsoft documentation for other OS version service packs as well.
- How to obtain the latest Windows 2000 service pack is explained in [Microsoft Knowledge Base Article #260910](#)

Choose “Network installation” option for Windows Service Pack Express/Network Installation for downloading a service pack to create a RIS image. Windows 2000 Service pack 3 download process is explained in <http://www.microsoft.com/Windows2000/downloads/servicepacks/sp3/download.aspx>. Similar download pages can be found in Microsoft documentation for other OS version service packs as well.

**3 (Optional) To provision non-English versions of the Windows OS, you need to do some additional configuration when you set up the image on the RIS server.**

Basically, the RIS server assumes that you have files in an English path. To resolve this issue, copy the other language’s files to the English path.

**a. Go to the directory in which the OS Chooser files live.**

For example:

```
% cd RemoteInstall\OSChooser
```

**b. Copy the files from the language directory to an English directory.**

For example:

```
% copy -r Japanese English
```

This creates a directory `RemoteInstall\OSChooser\English` that contains the install screens in the native language. When the RIS software looks into the default English path, it will display the non-English OS Chooser screens during install.

## ▼ To Set the BIOS Boot Order on a Manageable Server

**Before You Begin** Ensure that the Windows operating system is supported on each target manageable server. For a list of manageable servers that support the Windows operating system, see [Table 2-6](#).

**1 Set the BIOS Settings on the target host in the following order:**

- a. **Boot from Hard Disk**
- b. **Boot from Network (PXE-enabled)**
- c. **Boot from CD**
- d. **Boot from Floppy**

**2 Identify the target host's primary NIC MAC address for a PXE network boot and the Globally Unique Identifier (GUID) value.**

You can obtain the GUID from the target host's BIOS settings or from any of the following other sources:

- A label on the side of the computer case.
- A label within the computer case.
- The basic input/output system (BIOS) of the client computer.
- Network traffic from the client computer. You can use a network utility to sniff the network traffic and locate the DHCPDiscover packet. That field will contain the 128-bit, 16-byte GUID or a 128 bit Universally Unique Identifier (UUID).

---

**Note** – The GUID must be in the form {*ddddddd-dddd-dddd-dddd-dddddddddd*}, where *d* is a hexadecimal text digit. For example, {921FB974-ED42-11BE-BACD-00AA0057B223}. Valid entries for the client GUID are restricted to the numbers 0 through 9, lowercase alphabetical characters, uppercase alphabetical characters, and a dash.

---



---

**Caution** – Spaces, underscores, and other special symbols are not permitted in a GUID nor in a UUID.

---

# Installing and Configuring an OS on the Management Server

---

This chapter provides the procedures for installing and configuring an operating system on the Sun N1 System Manager management server.

This chapter discusses the following topics:

- “Installing the Solaris OS on the Management Server” on page 53
- “Installing the RedHat Enterprise Linux OS on the Management Server” on page 55
- “Management Server Configuration” on page 56

To ensure that you select the correct operating system for the management server, see [Table 2–2](#).

## Installing the Solaris OS on the Management Server

This section provides procedures for installing and configuring the Solaris OS on your management server. The Solaris OS must be installed on the management server before you can install the N1 System Manager system software.

This section discusses the following topics:

- “Solaris OS Disk Drive Considerations” on page 53
- “Solaris OS Installation Requirements” on page 54

### Solaris OS Disk Drive Considerations

The Solaris OS must be installed on an empty hard drive that contains no partitions or data. If the hard drive contains partitions, delete the partitions before installing the Solaris OS.

The following table provides the partitioning information for SPARC and x86 architecture management server, based on the minimum requirement of a 72-gigabyte hard drive.

TABLE 3-1 Solaris-based Management Server Partitioning

Partition	Mbytes
swap	Two to three times total system RAM, or 4 Gbytes, whichever is greater
/	All remaining space

**Note** – Allocate 3 Gbytes of free space for each distribution you plan to provision. If needed, upgrade the management server to a larger hard drive before continuing.

## Solaris OS Installation Requirements

Install the entire Solaris distribution on the management server. For a list of qualified Solaris operating systems, see [“Management Server Requirements” on page 18](#).

When installing the Solaris operating system on the management server

- Ensure the partitions on all disks on the management server have been deleted before installing the Solaris operating system.
- When prompted for the Type of Install, choose Custom Install.
- When prompted to provide the Ethernet port selections, assign the IP addresses, netmask, and gateway values according to your chosen reference architecture.
- When prompted for the Software Group, choose Entire Group Plus OEM.
- When prompted for disk selection, choose all available disks.
- When prompted to lay out file systems:
  - Remove all partitions except swap and / (root).
  - Ensure that the swap partition is two to three times total system RAM or 4 Gbytes, whichever is greater.
  - Assign all remaining free space to / (root).

After you have installed Solaris 10 on your management server:

- If you have chosen to install a mail service on the management server for management of your ALOM-based manageable servers instead of using the internal N1 System Manager mail service:
  - Install package `SFWimap` from the Solaris OS installation Complementary CD-ROM.
  - Configure the mail service as described in “Configuring the Management Server Mail Service and Account” in *Sun N1 System Manager 1.2 Site Preparation Guide*.

For information about which manageable servers are ALOM-based, see [Table 2-5](#).

- If you plan to manage SPARC-based manageable servers, enable FTP as described in [“Enabling FTP on the Management Server” on page 58](#). For information about which manageable servers are SPARC-based, see [Table 2–5](#).
- If you do not plan to manage SPARC-based manageable servers, update the `/etc/hosts` file as described in [“Updating the `/etc/hosts` File” on page 59](#).

## Installing the RedHat Enterprise Linux OS on the Management Server

This section provides procedures for installing and configuring the Linux OS on your management server. The Linux OS must be installed on the management server before you can install the N1 System Manager system software.

This section discusses the following topics:

- [“Linux OS Disk Drive Considerations” on page 55](#)
- [“Linux OS Installation Requirements” on page 56](#)

### Linux OS Disk Drive Considerations

Linux must be installed on an empty hard drive that contains no partitions or data. If the hard drive contains partitions, delete the partitions before installing the Linux OS.

The following table provides the partitioning information for the management server, based on the minimum requirement of a 72-gigabyte hard drive.

TABLE 3–2 Linux-based Management Server Partitioning

Partition	Size
<code>/boot</code>	102 Mbytes
<code>swap</code>	Two to three times system total RAM, or 4 Gbytes, whichever is greater
<code>/</code>	All remaining space

If your hard drive is larger than 72 Gbytes:

- Do not change the assigned space for swap.
- Allocate the space shown above for `/boot`.
- Allocate the remaining space to `/` (root).

## Linux OS Installation Requirements

Install the entire Linux distribution on the management server. For a list of qualified Linux operating systems, see [“Management Server Requirements” on page 18](#).

When installing Linux on the management server:

- Ensure the partitions on all disks on the management server have been deleted before installing the Linux operating system.
- If you are installing Red Hat Enterprise Linux AS 4.0 Update 1 or later, when prompted whether to enable SELinux, choose Disable. N1 System Manager does not support SELinux fully enabled.
- When prompted for the boot loader, choose Grub.
- When prompted for partitioning information:
  - If you are installing using the graphical installation mode, choose , choose Automatically Partition.
  - If you are installing using the text installation mode, choose , choose Autopartition.

You are prompted to choose whether to remove all Linux partitions, remove all partitions, or keep all partitions. Choose Remove all partitions. The partitioning values are displayed.

- Remove all partitions except boot, swap and / (root).
- Ensure that the swap partition is two to three times total system RAM or 4 Gbytes, whichever is greater.
- Assign all remaining free space to / (root).
- When prompted to provide the Ethernet port selections, assign the IP addresses, netmask, and gateway values according to your chosen reference architecture.
- When prompted for the firewall configuration, choose No firewall.
- When prompted for package installation:
  - If you are installing using the graphical installation mode, choose Customize the set of packages to install.
  - If you are installing using the text installation mode, choose Customize software selection.
- When prompted for the set of packages to install, choose Everything.

## Management Server Configuration

This section provides the post-operating installation configuration procedures that must be performed before you can install the N1 System Manager 1.3 software.

- [“Installing the Internationally Compliant Perl Module” on page 57](#)
- [“Enabling FTP on the Management Server” on page 58](#)
- [“Updating the /etc/hosts File” on page 59](#)



## Installing the Internationally Compliant Perl Module

N1 System Manager requires Perl version 1.5.3–16 or above to ensure correct functioning in any locale. This section provides the procedure for downloading and installing the internationally compliant Perl module.

### ▼ To Download and Install the Internationally Compliant Perl Module

- 1 Log in as root on the N1 System Manager management server.
- 2 Open a web browser and find a site that provides the `perl-5.8.3-16.i386.rpm` file for download.
- 3 Download the `perl-5.8.3-88.4.i386.rpm` file to a directory on the management server.
- 4 In a terminal window, change directory to the location where you saved the RPM file.
- 5 Type `rpm -i --force perl-5.8.3-16.i386.rpm` to install the Perl module.

**Next Steps** Ensure port 162 is not in use on the management server as described in the next section.

## Ensure Port 162 is not in Use

N1 System Manager requires exclusive use of port 162 for SNMP trap notifications. To determine if port 162 is assigned to any process, proceed as follows:

### ▼ To Determine Whether Port 162 is in use

- 1 Log in as root on the management server.
- 2 Type `grep 162 /etc/services` to determine whether port 162 has been assigned to a process.
  - If only the command prompt is returned, then port 162 has not been assigned to a process. No further action is required.
  - If port 162 is assigned to a process on the management server, then results similar to the following are displayed:
    - Solaris:
 

```
# grep 162 /etc/services
snmpd      162/udp   daemon name      #daemon description
```
    - Linux

```
# grep 162 /etc/services
snmp    162/TCP  #Simple Net Mgmt Proto
snmp    162/UDP  #Simple Net Mgmt Proto
```

You must disable the daemon or application that is using port 162. To disable a daemon, refer to the operating system documentation. To disable an application that is using the port, refer to the application documentation.

**Next Steps** Enable FTP on the management server as described in the next section.

## Enabling FTP on the Management Server

If you plan to manage SPARC-based manageable servers, you must enable the FTP service on the management server.

### ▼ To Enable FTP on a Solaris Based Management Server

- 1 Log in to the management server as root.
- 2 Type the command `svcadm -v enable network/ftp`.

The FTP service is enabled, and starts when the management server is rebooted. After the system is rebooted, you can verify whether the FTP service has start using the `inetadm` command:

```
# inetadm
enabled  online          svc:/network/telnet:default
enabled  online          svc:/network/nfs/rquota:default
disabled disabled       svc:/network/echo:dgram
disabled disabled     svc:/network/time:stream
enabled  online          svc:/network/ftp:default
```

**Next Steps** Update the `/etc/hosts` file as described in [“Updating the /etc/hosts File”](#) on page 59

### ▼ To Enable FTP on a Linux Based Management Server

- 1 Log in to the management server as root.
- 2 Create symbolic links to the `/etc/init.d/vsftpd` file in the `/etc/rc3.d` and `/etc/rc5.d` directories.

For example:

```
# ln -s /etc/init.d/vsftpd /etc/rc3.d/S99vsftpd
# ln -s /etc/init.d/vsftpd /etc/rc5.d/S99vsftpd
```

The FTP service is enabled, and starts when the management server is rebooted. After the system is rebooted, you can verify whether the FTP service has started by using the `ps` and `grep` commands:

```
# ps -eaf | grep ftp
root    3035    1  0  16:27 ?        00:00:00 /usr/sbin/vsftpd /etc/vsftpd/vsf
```

**Next Steps** Update the `/etc/hosts` file as described in the next section.

## Updating the `/etc/hosts` File

The IP address and the name of your management server must be added to the `/etc/hosts`. Failure to add the IP address and name will cause Sun N1 System Manager installation to fail.

### ▼ To Update the `/etc/hosts` file

- 1 Log in as root to the Sun N1 System Manager management server.
- 2 Verify that the `/etc/hosts` file has entries for loopback and the management server.
  - a. Make certain that either of the following loopback entries is in the `/etc/hosts` file.

```
127.0.0.1    localhost
```

or

```
127.0.0.1    localhost.localdomain    localhost
```

- b. Make certain that an entry exists for the management server and its IP address. For example:

```
111.11.111.11 n1mgmt.domain n1mgmt.domain
```

where `111.11.111.11` is the IP address of the management server, and `n1mgmt` is the name of the management server and `domain` is your company domain name.

Your `/etc/hosts` should be similar to the following example:

```
127.0.0.1    localhost.localdomain    localhost
10.5.157.123 n1mgmt.company.com
```

- c. Save and close `/etc/hosts`.
- 3 Reboot the N1 System Manager management server.

## Mail Server Considerations

ALOM-based manageable servers use mail services to send host event notifications to the N1 System Manager.

If you plan to manage ALOM-based manageable servers, you must decide whether to use the secure N1 System Manager internal mail service, or install, configure, and use a full mail service.



---

**Caution** – Using an external mail server for event notifications exposes the N1 System Manager to man in the middle attacks, denial of service attacks, and other external security risks.

---

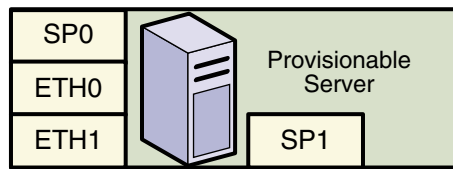
- The secure N1 System Manager embedded mail service does not require configuration or installation. The only requirement is that port 25 must be available and that port 25 is not in use on the management server.
- If you choose to use a mail service, configure the mail service as described in “Configuring the Management Server Mail Service and Account” in *Sun N1 System Manager 1.2 Site Preparation Guide*.

For information about which manageable servers are ALOM-based, see [Table 2-5](#).

## Alternate Sun Fire V20z and V40z Reference Configuration

---

Sun Fire V20z and V40z servers have two management ports, SP0 and SP1, as shown by the following logical port diagram.



The Sun Fire V20z and V40z servers can be connected to a switch in either of two ways:

- Direct connections:
  - The SP0 port of each server connects directly to the switch for the management network. Therefore, the switch must have a 1-Mbit port for each server.
- Daisy-chaining:
  - The SP0 port of the first server must be connected to the switch.
  - The SP1 port of the first server must be connected to the SP0 port of the second server.
  - The SP1 port of the second server must be connected to the SP0 port of the third server and so on.

---

**Tip** – To ensure performance, daisy-chain up to five Sun Fire V20z and V40z architecture machines. If you have more than five Sun Fire V20z or V40z management port machines, daisy-chain the machines in clusters of five.

---

Therefore, the switch needs only one 1-Mbit port for each group of five Sun Fire V20z and V40z servers.

The following figure illustrates a Sun Fire V20z and V40z daisy-chained configuration.

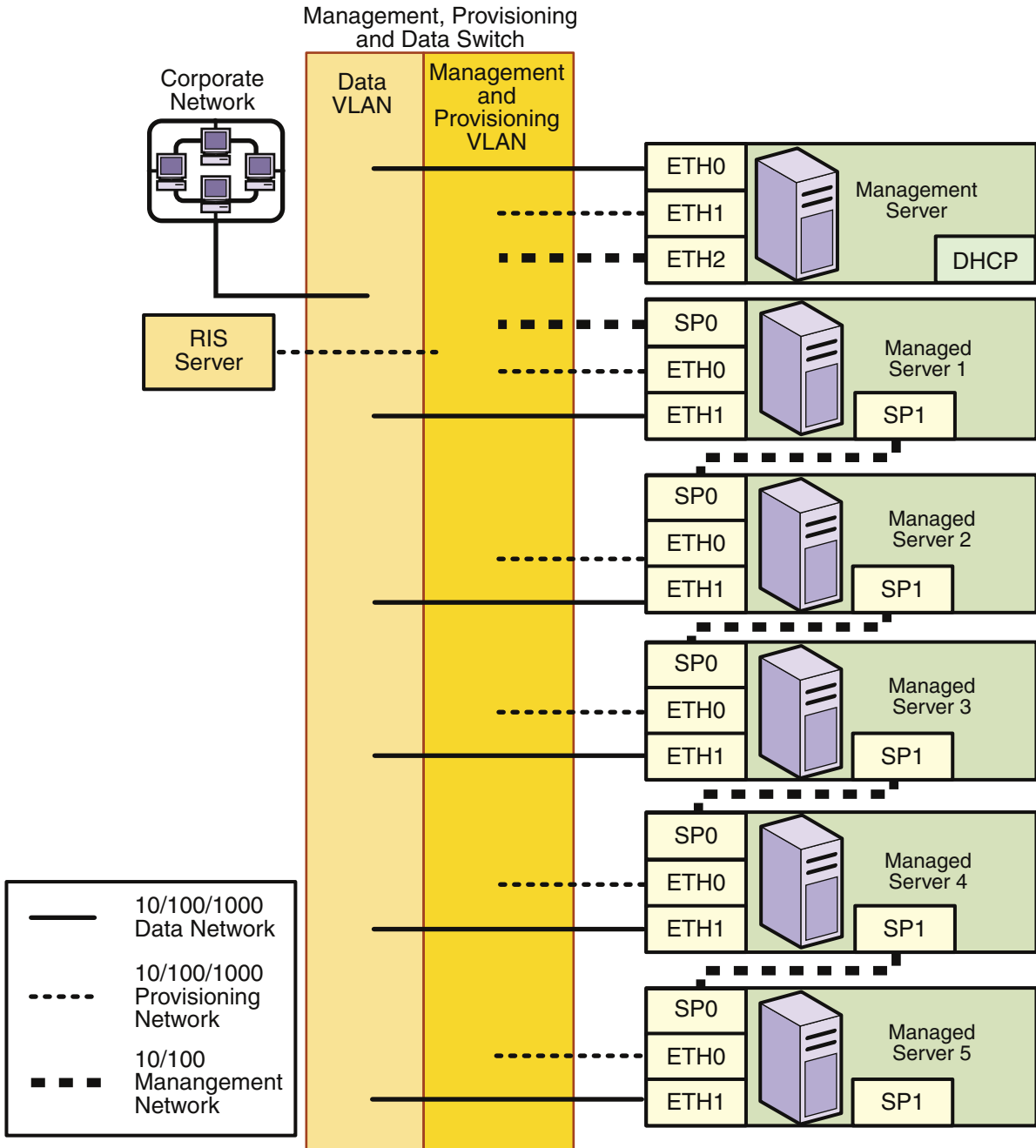


FIGURE A-1 Five Daisy-Chained SP Manageable Servers, One Switch

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